

eighth inches. The exterior depth is two inches and a quarter and the interior depth one inch and three quarters.

The nest of June 6, which will complete the present series, was found in a locality similar to the nest first described, at an altitude of 3000 feet. It was built in a 'catclaw'—a kind of small mesquite—four feet from the ground. The situation was at the extremity of a branch in a horizontal V-shaped fork, to which two-thirds of the rim is fastened, the other third being free. But considerable support was afforded, directly underneath the nest, by a small twig, which is fastened into the structure. The materials do not vary from those of the first nest of June 2 already described, either inside or out, except that a few downy feathers are added to the lining. The whole is a symmetrical half-sphere in shape. External diameter, two and three-fourths inches; interior diameter, two and one-fourth inches. Exterior depth, two inches; interior depth, one inch and three-quarters. It contained three slightly incubated eggs, which do not vary in color from those already described, except that the spots are of a slightly redder brown, and they are more concentrated at the larger end. The eggs are rather smaller and even more rounded in general shape than the other set spoken of, being but little more pointed at one end than at the other. They measure $.72 \times .53$, $.70 \times .55$, and $.68 \times .53$ inches, respectively.

My series of this species at present numbers fifty-four specimens—forty-two males and twelve females—all taken, with the one exception noted above, between April 1 and June 11 of the present year. They present very little variation in size or color, and the young in first plumage do not differ materially from the adult birds.

LIST OF BIRDS OBSERVED IN SUMMER AND FALL ON THE UPPER PECOS RIVER, NEW MEXICO.

BY H. W. HENSHAW.

THE observations embodied in the following list were made during the interval between July 18 and October 28, 1883, by

Mr. E. W. Nelson and the writer, in the mountains about forty miles east of Santa Fé, New Mexico. As faunal lists of the birds of New Mexico are yet by no means as numerous as is desirable, and as the summer avifauna of the region embraced in our observations is almost or quite unknown, I have thought it worth while to present them to the consideration of the readers of 'The Auk.'

For the time above indicated, and for an area of country of say five square miles, it is believed our examination was extremely thorough, and it is doubtful if a single species breeding within that area escaped notice. Although equal attention was paid to the fall migrants, it is not impossible that by rapid movements a few species which chanced to occur in small numbers may have passed by unheeded.

At first sight the list will appear to be remarkable for what it does not contain rather than for what it does, and there are few traces in it of the richness usually associated with Arizona and New Mexican bird lists. That the cause of its meagreness in species, and the absence of southern forms may be clearly understood, it is necessary that the nature of the country be thoroughly comprehended.

The Pecos River winds the greater part of its long and tortuous course through the state of Texas, emptying into the Rio Grande. Rising, as it does, in the mountains of New Mexico, it might be thought that its course would furnish a readily travelled highway from the Rio Grande Valley for Texan and possibly for Mexican species. Possibly in the lower part of its course it may afford such a highway, but the list will show that no intrusion of Texas birds towards its sources takes place, and — so far as the mountain part of its course is concerned — the reason is readily apparent; for, in following its windings, no sooner do we reach the mountains than we find a new climate and an entirely new character of country, and one of forbidding aspect to lowland-loving species. For the greater part of its course, especially in Texas, it flows a sluggish stream confined between low banks, the vegetation of which is limited to low willows and scrub, with here and there groves of cottonwoods. As it nears the mountains the scene changes, as if by magic. First come foot-hills, thickly clothed with piñons and cedars — typical home of the Piñon and Woodhouse Jays. Ere many miles the stream begins to cañon, and thence on the pines and spruces begin to put in an appear-

ance, until, fifteen miles above the foot-hills, it cuts its way through a deep course, with extremely picturesque walls of rock, and with every element of the wild mountain scenery which accompanies its cañons to its sources. The water, when undisturbed by the frequent summer rains, is clear and cold, and, like most similar mountain streams, harbors great numbers of fine trout. Even in midsummer the temperature of the region is cool and refreshing, the natural effect of low latitude being counteracted by the altitude, and even more by frequent prolonged rains and thunder showers, which latter are often accompanied by hail. These showers are of almost daily occurrence (or were in 1883) from about the middle of July till the first of October.

The focus of our operations was at the junction of a small tributary — Willow Creek — with the main stream, some twenty miles from Glorietta, on the Atchison, Topeka, and Santa Fé Railroad. Glorietta may be taken as representing the foot-hill region, with which the present paper has nothing to do.

The character of the vegetation that clothes the mountain ridges is essentially sub-alpine. The elevation at the mouth of Willow Creek is about 7800 feet, but the ascent from this point is extremely rapid, whether the main stream be followed or any of the side cañons, which form beds for the numerous rivulets that make their way on all sides from the heights above.

The highest mountain in the vicinity is Mt. Baldy, which is distant some twenty miles from the mouth of Willow Creek, and 12,661 feet above sea level. This peak we were not able to visit, though it is not probable that any very marked change takes place in the character of the avifauna in so short a distance.

At the height of our camp (7800 feet) a luxuriant growth of pines covers the hills, giving way, a thousand feet higher, though not wholly, to the spruces. On many of the gentle slopes, the pines are thinly dispersed, and are so scattered, or gathered in picturesque groups, as to convey the idea of artificially arranged parks — a suggestion still further heightened by the sward of green grass, enlivened with patches of bright flowers. The summits of many of the smaller heights are almost entirely bare of trees and shrubbery, and are covered with a luxuriant growth of grasses, affording the finest sort of pasturage. The sides of many of the ridges and cañons are heavily clothed with brush, mainly of scrub oak. At a height of about 7500 feet, scattered aspens be-

gin to put in an appearance, and soon assert a place for themselves in the shape of large groves. Wherever fire has devastated the pine tracts the fire-cleared space is immediately occupied by aspens, which spring up in the shape of extremely dense thickets — so dense that in them the vision is limited to the space of a very few feet. These are the favorite haunts of deer and bear. Everywhere the streams are densely fringed with brush of various sorts, chiefly, however, willows and alders, and it is these thickets that form the chief resort for the smaller birds. Flowers of many kinds and of various hues are visible on all sides, and no sooner is one species through flowering than another takes its place. In short, the flora is of the character usually pertaining to mountain areas of low latitude where a deep and fertile soil, added to a copious rainfall, combine to produce an abundant vegetation.

Our observations began sufficiently early (July 18) to make sure of all the summer residents, and they were continued until the close, or near the close, of the fall migration, the first indications of which were noticed about August 1.

I was particularly interested in ascertaining the exact time of the beginning of the fall migration, but it is a matter of no little difficulty to determine, in the case of a given locality, just when the first movement southward begins; nor is it less difficult in the case of a given species of bird. Among the smaller birds, the first act in the final drama of migration is the assemblage of individuals into flocks, either of one or of many species. But this gathering begins as soon as the young are fairly on the wing, and, in the instance of many species, before the young are strong enough to travel. It is quite certain that the small birds generally do not undertake the fall journey until the old ones have somewhat recuperated from the effects of family cares, and until the young have gained their full strength. But, so far as observation of these flocks goes, there is little to be learned, since it is practically impossible to determine whether the flocks under observation from day to day consist of the same individuals, or are fresh arrivals from farther north. For instance, on our arrival, July 18, many of the Nuthatches and Audubon's Warblers had already gathered into flocks of old and young, and while in flocks the young passed from the nestling into fall plumage, and the adults donned their fall dress. There was thus an interval of probably three weeks before any of them migrated, if indeed the Nut-

hatches migrated at all. The observer is conscious of a general movement among the small birds, but it is difficult to tell whether it is actual migration or not until certain evidence presents itself in the arrival of species previously unnoticed. So, at least, it was in the present case; and the first supposed migrating visitor was seen August 8 — a single Wilson's Flycatcher (*Myiodiectes pusillus*). Previous to this, however, there had been a movement on the part of the Hummingbirds, which was disclosed by the sudden departure of the males of *Selasphorus platycercus*, which took place about August 1, and constituted the first positive evidence of the fall migration.

After August 8 the tokens of a general movement on the part of the birds became perfectly evident; and soon flocks of birds from farther north put in an appearance. At this time the birds, instead of being scattered through the woods, according to the exigencies of nesting, were gathered into large flocks, composed of the most heterogeneous elements. Bluebirds, Nuthatches, Titmice, Warblers, Creepers, Snowbirds, and Woodpeckers, all trooped through the forest together, and where one moment reigned perfect silence, the next was enlivened by a chorus of chirps and call-notes, the signals by which the motley throng is held together in an ever moving but united band. As the fall advanced, these flocks were of less frequent occurrence and contained a smaller number of species, as well as of individuals, until towards the end of October, when they were composed mainly of Snowbirds, Nuthatches, and such species as intended to winter not far away.

The list pretends to be nothing but a record of our own observations, and whatever value it may possess will be derived mainly from the fact that it contains no species but those actually seen, and leaves those which were not seen to be added by the labors of future investigators.

1. *Hylocichla ustulata swainsoni*. SWAINSON'S THRUSH. Fairly numerous in fall. First appeared September 13.

2. *Hylocichla unalascae*. DWARF THRUSH. — Rare; in fall only. A single specimen secured October 12.

2 a. *Hylocichla unalascae auduboni*. ROCKY MOUNTAIN HERMIT THRUSH. — Numerous as a summer resident. The young were out of the nest July 18.

3. *Merula migratoria propinqua*. WESTERN ROBIN. — Was not detected breeding, although it probably summers here. Common in fall.

4. *Cinclus mexicanus*. AMERICAN WATER OUZEL. — Numerous all along the upper Pecos. By July 18, the time of our arrival, young birds

were able to care for themselves, though not yet fully divested of the nestling plumage. Abandoned nests were seen on ledges of rock overhanging the stream, and one pair had built on a stringer beneath a bridge.

5. *Sialia mexicana*. CALIFORNIA BLUEBIRD. — A numerous summer resident. Apparently the *S. arctica* does not breed here.

6. *Myiadestes townsendi*. TOWNSEND'S SOLITAIRE. — Numerous. Families of young birds in the curious mottled plumage, resembling young Thrushes, were being led through the pines by the old birds during the last half of July. The season of song had entirely passed.

7. *Regulus calendula*. RUBY-CROWNED KINGLET. — Young birds in nestling plumage were taken August 17 to September 11. This was the first intimation received that the species was present. It doubtless nested among the spruces, well up on the ridges. Abundant in fall.

8. *Parus montanus*. MOUNTAIN CHICKADEE. — Numerous summer resident; mainly confined to the evergreens.

9. *Parus atricapillus septentrionalis*. LONG-TAILED CHICKADEE. — Also numerous. Much more frequently seen among deciduous trees than the preceding. Both were conspicuous in fall among the gatherings of small birds.

10. *Sitta carolinensis aculeata*. SLENDER-BILLED NUTHATCH. — Abundant summer resident among the pines.

11. *Sitta pygmæa*. PYGMY NUTHATCH. — Extremely abundant. As soon as the young are out, the different families come together, and birds of various hatchings may be shot from the same flock. I was unaware how much time this species spends on the ground. In a large flock there are always more or less of its members searching on the ground for insects.

12. *Helminthophaga celata*. ORANGE-CROWNED WARBLER. — Fairly numerous in the breeding season, but more so during the fall migration. It seems a little curious that the *H. virginia*, which breeds abundantly in middle Colorado, was not detected here at all. It may possibly summer in the foothills, and it doubtless occurs among them in the migrations.

13. *Dendroeca æstiva*. YELLOW WARBLER. — The presence of this species was detected — that was all. Farther down the river it was doubtless more common.

14. *Dendroeca graciae*. GRACE'S WARBLER. — This species was one I confidently expected to find as a summer resident. Nevertheless, it was not discovered until after the fall flight had commenced, and the assumption is that all the specimens taken, perhaps half a dozen, came from farther north.

15. *Dendroeca auduboni*. AUDUBON'S WARBLER. — This Warbler breeds abundantly through the pine woods. Young birds were out of the nest July 18, and we saw them gradually assume the fall plumage, as well as the old change to their winter dress.

16. *Dendroeca townsendi*. TOWNSEND'S WARBLER. — This is well known as a Pacific coast species, and one not ascertained to breed anywhere in the Rocky Mountain Region. It made its appearance from the

north in considerable numbers about August 25. By September 20 it began to be uncommon. The last individual was seen September 28. It was always found associated with flocks of various other birds, and chiefly frequented the pines. The disproportionate number of young birds over old ones was very noticeable, not more than half a dozen of the latter being seen.

It would be interesting to know from just what source these Rocky Mountain migrants are derived, and why if, as seems probable, they come from the Sierras, they select this route instead of taking a due southern course. The species is unknown in the Rocky Mountains in spring, except along the southern border.

17. *Geothlypis macgillivrayi*. MACGILLIVRAY'S WARBLER. — This is another species which, as a summer resident, was to be expected. Not one was seen, however, until the bird appeared from the north, which it did the last days of August. In early September it became fairly common in the thickets along the streams.

18. *Myiodioides pusillus*. WILSON'S BLACKCAP. — So far as we could ascertain, this bird did not breed in the locality. The first one was seen August 8. It soon became extremely numerous; nowhere, in fact, have I ever seen it so abundant. It was found in every flock of migrants, and also in companies of half a dozen or more among the alders and willows of the streams.

19. *Vireo gilvus swainsoni*. SWAINSON'S VIREO. — Fairly numerous as a summer resident, though by no means so common as it is farther north. This locality may be, in fact, near the extremity of its southern limit in summer.

20. *Vireo solitarius plumbeus*. PLUMBEUS VIREO. — Rather common in summer, but not nearly so numerous as the bird is at this season in Colorado and other points to the northward. Almost exclusively restricted to the pines.

21. *Vireo solitarius cassini*. CASSIN'S VIREO. — This is another Pacific coast form, many individuals of which, for some unexplained reason, choose to reach their southern winter quarters by way of the Rocky Mountains rather than to follow the Sierras, where alone it is known to breed. It also is not known to occur in the Rocky Mountains in spring, except in the extreme southern portion of the range. It was first seen September 2 and soon became fairly numerous. It was found in the pines moving about with the Warblers and other migrating birds, but it also frequented the aspens and oak brush. It was a noticeable fact that while this bird was quite silent, the Plumbeous Vireo, which was now moulting its worn summer plumage, prior to moving south, was frequently in song, being, in fact, the only species that was so.

22. *Lanius ludovicianus excubitoroides*. WHITE-RUMPED SHRIKE. — A single bird was shot among some dead timber well up on a mountain ridge. The bird seemed to be quite out of place among its surroundings, and was, I presume, nothing but a straggler from the lower regions eastward.

23. *Tachycineta thalassina*. VIOLET-GREEN SWALLOW. — This, the only Swallow spending the summer in this locality, or in fact occurring at all, was extremely numerous all through the pine woods, where it finds every convenience for nesting in the multitude of perforated stubs. After the young were on the wing, the birds left the pine woods and resorted to the tops of the ridges and the open valleys where, high in mid-air, they were seen busily hunting for insects. September 8 they were still to be noticed, though the majority had departed some time before. A few days later and the last had disappeared.

24. *Pyranga ludoviciana*. LOUISIANA TANAGER. — Not common; a few breed. Apparently the bulk of the species spend the summer farther north, as in Colorado, and northwards it is numerous.

25. *Carpodacus cassinii*. CASSIN'S PURPLE FINCH. — Not common; but few apparently pass the summer here, and we saw but few in the fall.

26. *Loxia curvirostra americana*. RED CROSSBILL. — I saw but one Crossbill, October 20. As I failed to secure it, its identity cannot be fully established. It was, however, presumably not the var. *mexicana*, but the Common Crossbill, which in 1873 I found to breed in the mountains near Fort Garland, in Southern Colorado.

27. *Chrysomitris pinus*. PINE FINCH. — Abundant in early fall, and doubtless breeding, though not detected by us in summer.

28. *Centrophanes ornatus*. CHESTNUT-COLLARED LONGSPUR. — A single specimen was shot by Mr. Nelson, September 12. This individual was probably the one seen by me a few days previously. The occurrence of this plain-inhabiting species, in a narrow valley in the midst of the pine woods, was of course accidental.

29. *Centronyx bairdi*. BAIRD'S SPARROW. — Two specimens of this Sparrow were secured. Both were in extremely worn plumage, and in this respect were similar to the many specimens secured by me in Arizona in 1873. I then interpreted this condition to indicate that they had passed the summer not far away, believing that they could not have migrated any distance in such dress. The two specimens secured here throw little additional light on the matter, since they may have straggled up the Pecos from their breeding grounds in the open grassy plains below, or they may have dropped in as migrants from the far north, from Montana or Dakota. The latter supposition is perhaps the more probable. It is well-known that the species migrates to the north along the foothills of Colorado in spring, and there is no recorded evidence that it breeds either in Colorado or elsewhere south of the Union Pacific Railroad. Still I am not aware that any of our Sparrows migrate south in the excessively worn condition that attends nesting. They usually spend some time in recuperating, and the moult is usually well along before they migrate. Collectors in the region, south of the known summer habitat of this Sparrow, will do well to keep a sharp lookout for it.

(To be concluded.)